HANDY TRUCK LINE

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Department of Environmental Quality
State Air Program

Permit to Construct Application

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April 2008

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1.0 INTRODUCTION

This document contains the following sections that will serve to meet the Idaho Department of Environmental Quality (IDEQ) Permit to Construct (PTC) Application requirements provided in Idaho Administrative Procedures Act (IDAPA) 58.01.01.200-228 for the Handy Truck Lines facility located in Meridian, Idaho. Section 2.0 provides facility information, presents a process description, identifies emission units, and provides a summary of potential-to-emit (PTE) emissions from the facility. Section 3.0 discusses the Class II area air quality impact analysis. Modeling was conducted to demonstrate compliance with the National Ambient Air Quality Standards (NAAQS) and Idaho toxic air pollutant (TAP) standards. References are provided in Section 4.0. IDEQ PTC forms, emission calculations, modeling files, and other supporting documentation are provided in Appendices A through D. The manufacturer's data and climate data for Boise, Idaho are provided in Attachments 1 and 2. The Handy facility will be a minor source of criteria pollutants and hazardous air pollutants (HAPs).

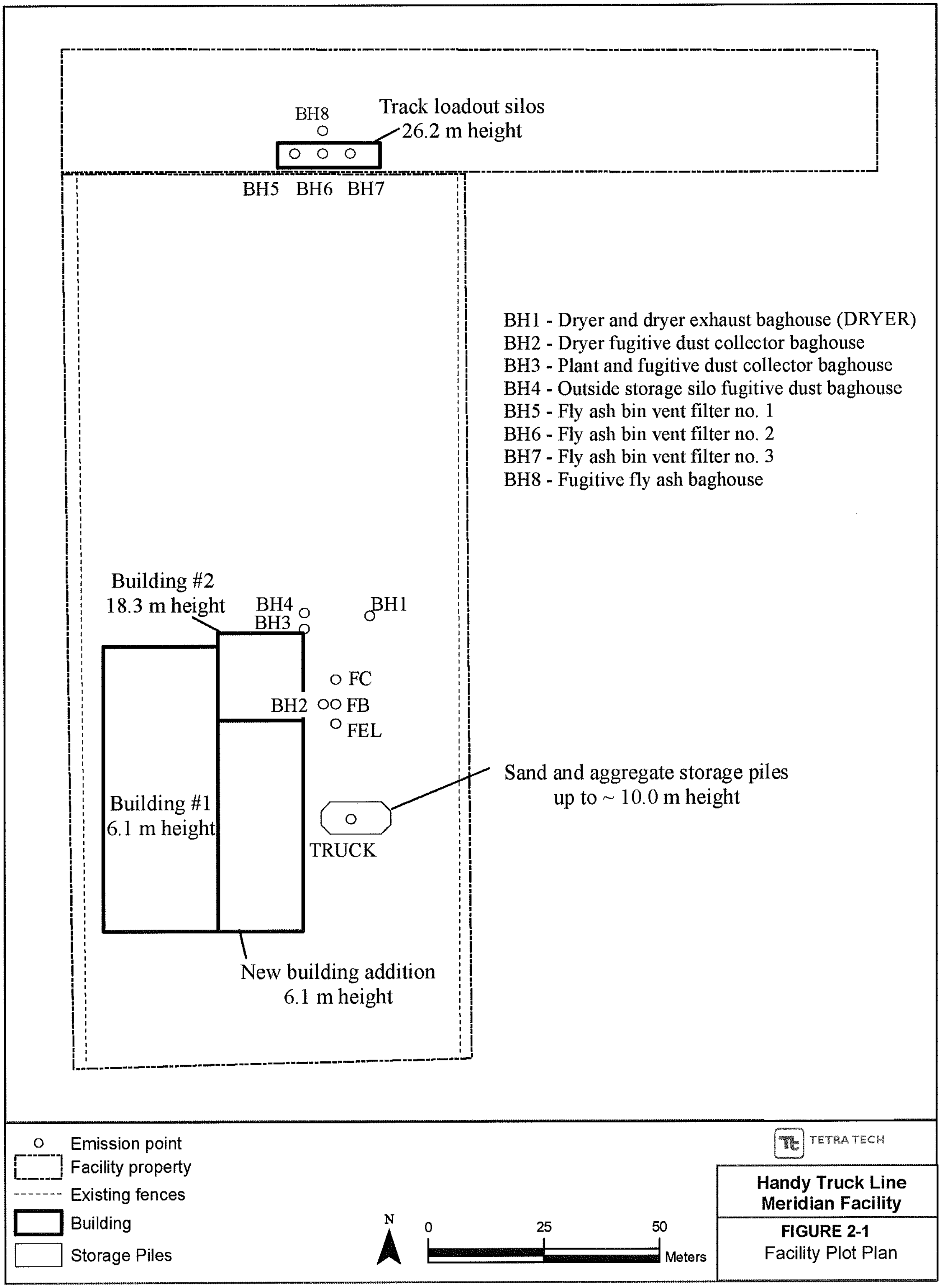
2.0 FACILITY INFORMATION

The Handy Truck Lines facility (Handy) is located at 630 East King Street, Meridian, Ada County, Idaho, in the Meridian Business Park. The Handy facility (SIC Code 3273) produces batch and custom mixtures of cement and concrete for commercial sales. During winter months (November through March), the Handy facility operates from 8:00am to 5:00pm, four days per week. During the summer months (April through October), the Handy facility operates from 5:00am to 5:00pm, typically six days per week.

The Handy facility is composed of three buildings connected by breezeways. These buildings are the Existing Building #1, Existing Building #2, and New Building Addition. Existing Building #1 and the New Building Addition contain storage warehouses, while Existing Building #2 houses the dry mix plant. Figure 2-1 shows a plot plan of the facility and the property boundaries, Figure 2-2 shows an aerial view of the facility, and Figure 2-3 shows a site location map. Note that the aerial photo (Image Year 2007) does not show the New Building Addition or the Ventilex dryer, though these structures currently exist on site. The facility is generally located at Universal Transverse Mercator (UTM) coordinates 549,700 meters (m) east and 4,828,400 m north [North American Datum (NAD) 83)], zone 11.

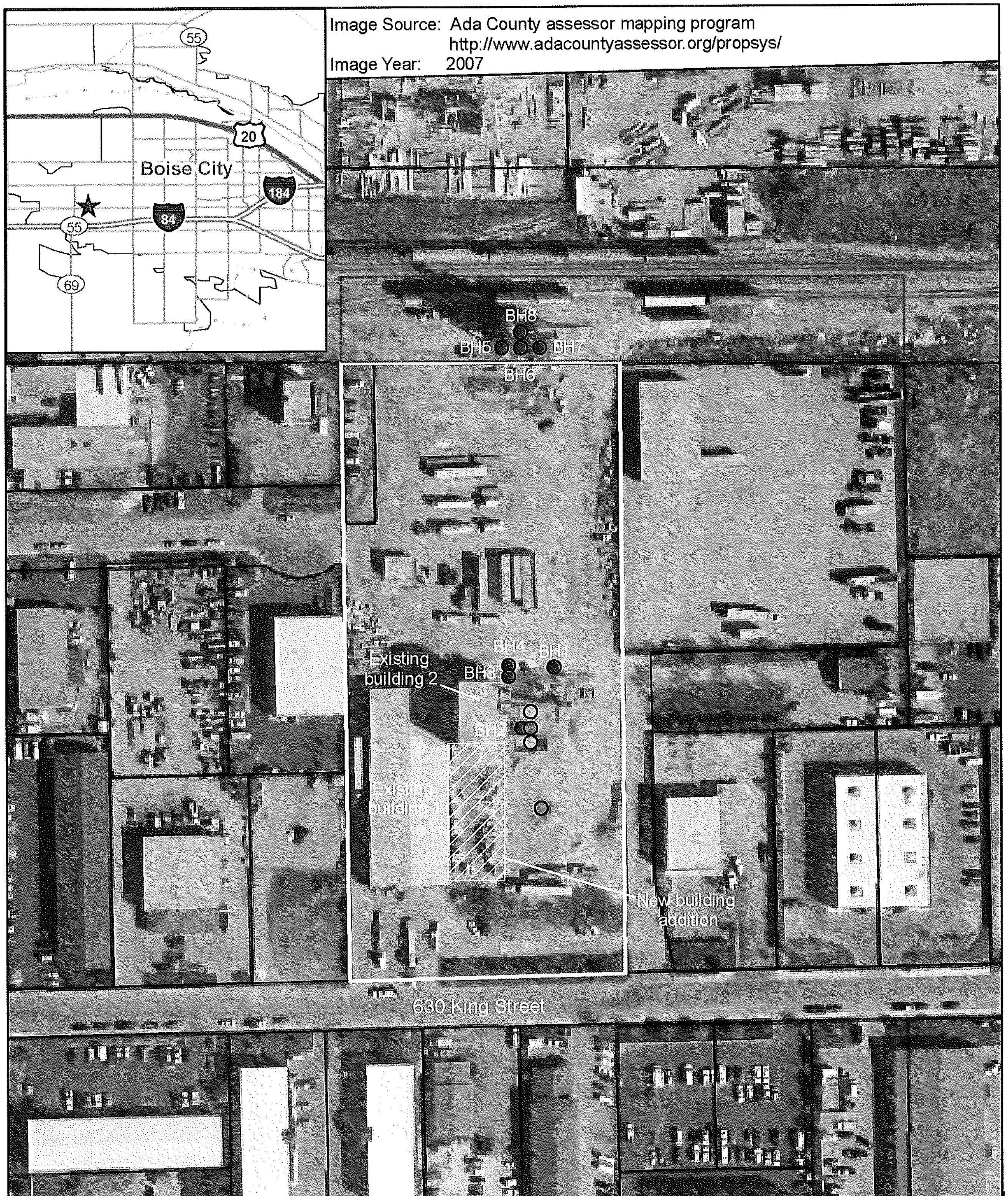
2.1 PROCESS DESCRIPTION

The Handy facility conducts two separate processes: fly ash and cement transloading, and cement and concrete production. In the fly ash and cement transloading process, fly ash and cement are first delivered to the Handy facility by railcar. A maximum of 335,000 tons per year (tons/yr) of fly ash and 600,000 tons/yr of cement may be delivered to the facility. The raw material is transferred via underground, covered screw conveyor to one of seven storage silos in the load-out area, which is adjacent to the railroad spur on the northern end of the property. Four baghouses control fugitive dust from the transloading area and storage silos. Most of the siloed material is loaded from the silos into delivery trucks, which transport the material offsite to ready-mix concrete companies. Bulk trailers pull onto the scale in the transloading area and an extendable boot is pulled down over a filling spout that is connected to a dust collector. A 20-inch access port is located on top of each trailer. The filling spout is lowered into this access port and the load of bulk material is dropped into the trailer. The typical load is 35 tons, and the loading rate is 15 minutes per load. Emissions from the truck loadout process are captured in the fugitive fly ash baghouse. Approximately 324,500 tons/yr of fly ash and 494,880 tons/yr of cement are shipped off-site. The remainder of the fly ash and cement is used by Handy in the cement and concrete production process, discussed below.



Handy Truck Line
Meridian Facility

FIGURE 2-1
Facility Plot Plan



Baghouses
BH1 - Dryer and dryer exhaust baghouse (DRYER)
BH2 - Dryer fugitive dust collector baghouse
BH3 - Plant and fugitive dust collector baghouse
BH4 - Outside storage silo fugitive dust baghouse
BH5 - Fly ash bin vent filter no. 1
BH6 - Fly ash bin vent filter no. 2
BH7 - Fly ash bin vent filter no. 3
BH8 - Fugitive fly ash baghouse

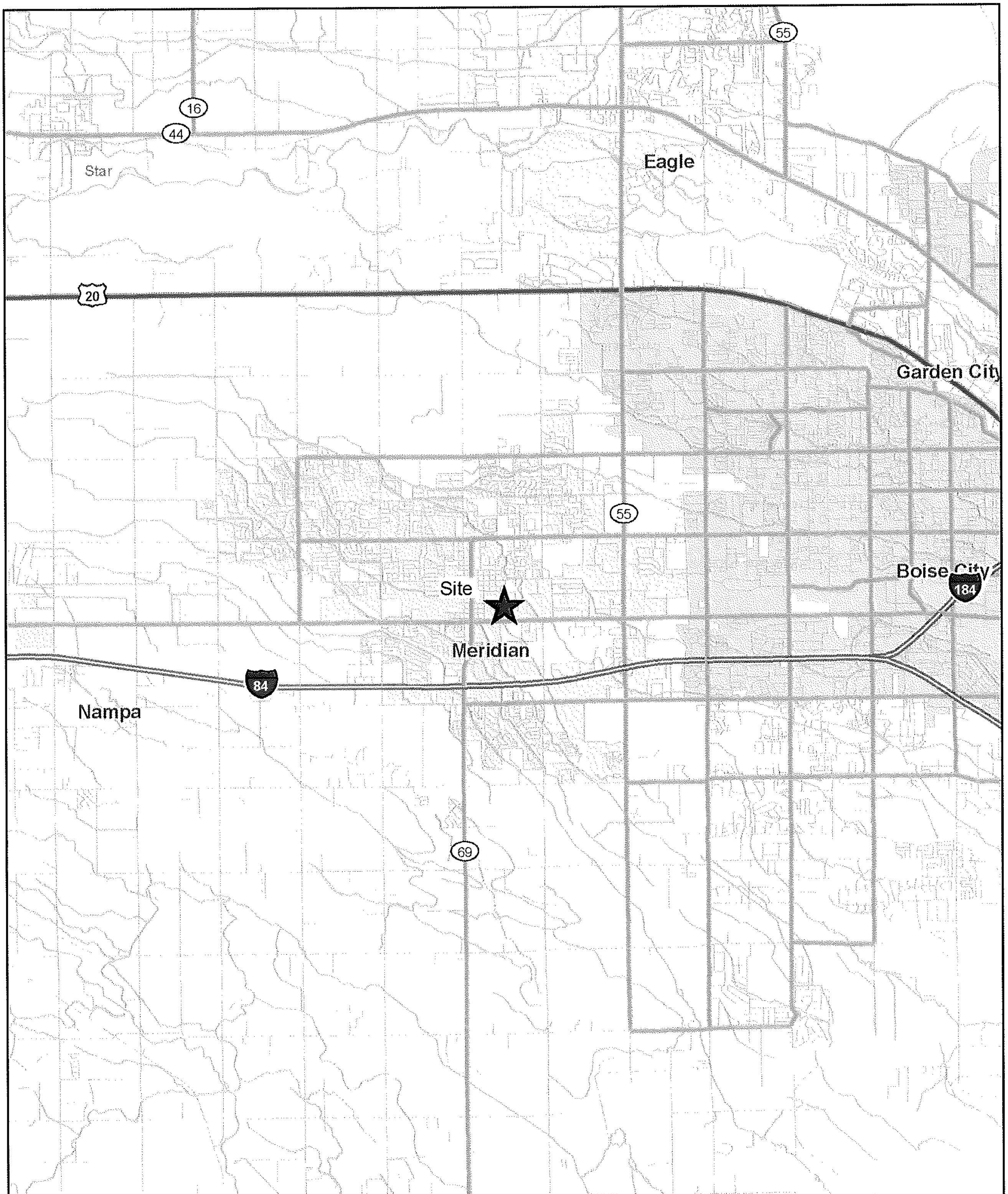
Hoppers (FEL)
Storage piles (TRUCK)
Feed conveyor transfer point (FC)
Feeder belt transfer point (FB)
Facility property
Railroad lease property
Parcels

N 0 20 40 Meters

TETRA TECH

Handy Truck Line Meridian Facility

FIGURE 2-2
Aerial View



★ Handy Truck Line Meridian Facility

Source: ESRI Data & Maps [CD-ROM]. (2005).
Redlands, CA: Environmental Systems
Research Institute.

N

0 2.5 5
Kilometers

TETRA TECH

Handy Truck Line Meridian Facility

FIGURE 2-3

Facility Location

The cement and concrete production process takes place both inside and outside the facility's buildings. Raw materials for this process consist of sand, gravel, fly ash, cement, and lime. First, trucks deliver sand and gravel (a maximum of 262,800 tons/yr sand and 131,400 tons/yr gravel) to the storage yard on the southeastern portion of the property, where the raw material is off-loaded into one of four uncovered stockpiles (typically, three sand piles and one gravel pile). The sand and gravel are typically moist in the winter and dry in the summer. The stockpiles are watered when necessary to reduce fugitive dust emissions, mainly during the summer months.

Sand and gravel are transferred from the storage piles to the wet product sand hopper or the wet product gravel hopper using a front-end loader. The hoppers are located outside of the buildings. From the hoppers, the sand and gravel are transferred to one of two feeder belts. From the feeder belts, sand and gravel are transferred to a feed conveyor, which feeds a 10-million BTU per hour (mmBTU/hr) natural gas-fired dryer, also located outside the main building. This fluid bed dryer has a maximum feed rate of 45 tons per hour (tons/hr) combined sand and gravel. The dryer controls the facility's production rate. The dryer could potentially operate 24 hours per day, 365 days per year, resulting in a maximum feed rate of 394,200 tons/yr combined sand and gravel. In the dryer, material is heated to 400 degrees Fahrenheit (°F) then cooled to ambient temperature. Efficient consumption of energy is attained through heat recovery from the flue gases. The fluid bed is divided into two compartments – one for drying and one for evaporative cooling within the same installation. Material is dried in the front compartment and cooled in the back compartment. Air from the cooling cycle is then used as intake air for the burner. Approximately 90% of the burner air is recycled air and 10% is fresh air from outside. Fugitive dust from the dryer is controlled with a dust collector. Two baghouses control emissions from the drying process.

Once the material is dried and cooled, it is transferred via conveyor to a classifier. The material is sorted in the classifier (7 mesh sand and ½-inch rock) and rejected or accepted based on size. The larger pieces are rejected and moved to the reject conveyor. The small amount of rejected material typically stays onsite and is used as parking area material. Accepted material is loaded into the bucket elevator.

The process moves inside the dry mix plant when the bucket elevator transfers sorted material to the dry mix storage silos. Three aggregate silos are used for storage of processed gravel and sand. Two of these silos are inside the facility and one is outside. The Handy facility uses six powder silos for storage of cement, fly ash, and lime, all of which are inside the facility. Cement and fly ash come from the transloading facility (105,120 tons/yr cement and 10,500 tons/yr fly ash) and are pneumatically loaded into the silos. The lime (approximately 15,800 tons/yr) is delivered via truck and pneumatically loaded into the silos.

From the silos, sand, gravel, fly ash, lime, and cement are metered out and transferred to the covered weigh belt feeder. This material is transferred via weigh belt feeder to the baffle mixer. The final mixture is then moved to the valve bagger for bagging. A baghouse controls fugitive dust emissions from the dry mix process.

Finished bags of cement and concrete are moved to the palletizer. Pallets of bags are moved using a forklift to the warehouse for shipping or storage. These pallets are loaded onto trucks, which then depart the property for the sales destination. The maximum annual production capacity is 525,600 tons/yr cement and concrete.

2.2 SUMMARY OF EMISSION UNITS

The following emissions units are included in the Permit to Construct application:

- Baghouses
- Conveyor transfer points
- Sand and gravel loading and unloading
- Ventilex dryer

Tables 2-1, 2-2, 2-3 and 2-4 contain summary emission estimates for these processes. Tables 2-1 and 2-2 present annual emission rates for criteria pollutants and HAPs. Tables 2-3 and 2-4 present annual emission rates for TAPs. Emission rates in all tables are apportioned by source. Maximum processing and production rates were used to calculate emissions. Details of emissions calculations for all Handy facility sources have been provided with this permit application. According to IDEQ, emissions from vehicles and wind erosion do not need to be included in the emission inventory (IDEQ 2008a) and have therefore not been quantified herein. Chromium-VI speciation estimates were provided by IDEQ (IDEQ 2008e).

2.3 INSIGNIFICANT ACTIVITIES

Certain operations and activities performed on-site produce air emissions that are considered insignificant with respect to Idaho Tier I air quality permit regulations, according to the Idaho Administrative

Procedures Act (IDAPA) 58.01.01.317. However, it does not appear that activities at the facility can be considered insignificant under Idaho modeling guidelines. Therefore all quantified emission units at the Handy facility were included in the dispersion modeling effort.

TABLE 2-1

PROJECTED FACILITY-WIDE ANNUAL CRITERIA POLLUTANT AND HAP EMISSIONS (TONS PER YEAR)[1]

EMISSIONS	Dryer	Baghouse Emissions	*TOTAL POINT SOURCE EMISSIONS*	Material Handling Sources[2]	Conveyor Belt Emissions	*TOTAL FUGITIVE EMISSIONS*	TOTAL EMISSIONS
Criteria Pollutants							
CO	8.76	--	*8.76*	--	--	*--*	**8.76**
NOx	4.60	--	*4.60*	--	--	*--*	**4.60**
PM_{10}	0.33	24.62	*24.94*	0.57	0.69	*1.27*	**26.21**
PM	0.33	24.62	*24.94*	1.22	1.46	*2.67*	**27.62**
VOC	0.24	--	*0.24*	--	--	*--*	**0.24**
SO_2	0.03	--	*0.03*	--	--	*--*	**0.03**
Pb	2.15E-05	--	*2.15E-05*	--	--	*--*	**2.15E-05**
HAPs							
Benzene	9.02E-05	--	*9.02E-05*	--	--	*--*	**9.02E-05**
Formaldehyde	3.22E-03	--	*3.22E-03*	--	--	*--*	**3.22E-03**
Hexane	7.73E-02	--	*7.73E-02*	--	--	*--*	**7.73E-02**
Naphthalene	2.62E-05	--	*2.62E-05*	--	--	*--*	**2.62E-05**
Toluene	1.47E-04	--	*1.47E-04*	--	--	*--*	**1.47E-04**
Arsenic	8.59E-06	5.46E-09	*8.59E-06*	--	--	*--*	**8.59E-06**
Beryllium	5.15E-07	3.12E-10	*5.16E-07*	--	--	*--*	**5.16E-07**
Cadmium	4.72E-05	3.17E-10	*4.72E-05*	--	--	*--*	**4.72E-05**
Chromium	6.01E-05	4.23E-09	*6.01E-05*	--	--	*--*	**6.01E-05**
Cobalt	3.61E-06	--	*3.61E-06*	--	--	*--*	**3.61E-06**
Lead	--	2.65E-09	*2.65E-09*	--	--	*--*	**2.65E-09**
Manganese	1.63E-05	2.74E-07	*1.66E-05*	--	--	*--*	**1.66E-05**
Mercury	1.12E-05	--	*1.12E-05*	--	--	*--*	**1.12E-05**
Nickel	9.02E-05	3.10E-08	*9.02E-05*	--	--	*--*	**9.02E-05**
Selenium	1.03E-06	2.31E-10	*1.03E-06*	--	--	*--*	**1.03E-06**
Total HAPs	**8.10E-02**	**3.18E-07**	*8.10E-02*	**0.00E+00**	**0.00E+00**	*0.00E+00*	**8.10E-02**

1 '--' Emissions of compound are either not present or were not reported in the literature reviewed; 'TBD' To be determined.

2 Material handling sources include truck unloading and front-end loader loading.

TABLE 2-2

PROJECTED FACILITY-WIDE HOURLY CRITERIA POLLUTANT AND HAP EMISSIONS (POUNDS PER HOUR)[1]

EMISSIONS	Dryer	Baghouse Emissions	*TOTAL POINT SOURCE EMISSIONS*	Material Handling Sources[2]	Conveyor Belt Emissions	*TOTAL FUGITIVE EMISSIONS*	TOTAL EMISSIONS
Criteria Pollutants							
CO	2.00	--	*2.00*	--	--	*--*	**2.00**
NOx	1.05	--	*1.05*	--	--	*--*	**1.05**
PM_{10}	0.07	5.62	*5.70*	0.13	0.16	*0.29*	**5.98**
PM	0.07	5.62	*5.70*	0.28	0.33	*0.61*	**6.31**
VOC	0.05	--	*0.05*	--	--	*--*	**0.05**
SO_2	0.01	--	*0.01*	--	--	*--*	**0.01**
Pb	4.90E-06	--	*4.90E-06*	--	--	*--*	**4.90E-06**
HAPs							
Benzene	2.06E-05	--	*2.06E-05*	--	--	*--*	**2.06E-05**
Formaldehyde	7.35E-04	--	*7.35E-04*	--	--	*--*	**7.35E-04**
Hexane	1.76E-02	--	*1.76E-02*	--	--	*--*	**1.76E-02**
Naphthalene	5.98E-06	--	*5.98E-06*	--	--	*--*	**5.98E-06**
Toluene	3.36E-05	--	*3.36E-05*	--	--	*--*	**3.36E-05**
Arsenic	1.96E-06	1.25E-09	*1.96E-06*	--	--	*--*	**1.96E-06**
Beryllium	1.18E-07	7.13E-11	*1.18E-07*	--	--	*--*	**1.18E-07**
Cadmium	1.08E-05	7.23E-11	*1.08E-05*	--	--	*--*	**1.08E-05**
Chromium	1.37E-05	9.65E-10	*1.37E-05*	--	--	*--*	**1.37E-05**
Cobalt	8.24E-07	--	*8.24E-07*	--	--	*--*	**8.24E-07**
Lead	--	6.05E-10	*6.05E-10*	--	--	*--*	**6.05E-10**
Manganese	3.73E-06	6.25E-08	*3.79E-06*	--	--	*--*	**3.79E-06**
Mercury	2.55E-06	--	*2.55E-06*	--	--	*--*	**2.55E-06**
Nickel	2.06E-05	7.09E-09	*2.06E-05*	--	--	*--*	**2.06E-05**
Selenium	2.35E-07	5.26E-11	*2.35E-07*	--	--	*--*	**2.35E-07**
Total HAPs	**1.85E-02**	**7.26E-08**	***1.85E-02***	**0.00E+00**	**0.00E+00**	***0.00E+00***	**1.85E-02**

1 '--' Emissions of compound are either not present or were not reported in the literature reviewed; 'TBD' To be determined.

2 Material handling sources include truck unloading and front-end loader loading.

TABLE 2-3

PROJECTED FACILITY-WIDE ANNUAL TAP EMISSIONS (TONS PER YEAR)[1]

EMISSIONS	Dryer	Baghouse Emissions	*TOTAL POINT SOURCE EMISSIONS*	Material Handling Sources[2]	Conveyor Belt Emissions	*TOTAL FUGITIVE EMISSIONS*	TOTAL EMISSIONS
Organic TAPs							
Benzene	9.02E-05	--	*9.02E-05*	--	--	--	**9.02E-05**
Benzo(a)pyrene	5.15E-08	--	*5.15E-08*	--	--	--	**5.15E-08**
Formaldehyde	3.22E-03	--	*3.22E-03*	--	--	--	**3.22E-03**
Hexane	7.73E-02	--	*7.73E-02*	--	--	--	**7.73E-02**
3-Methylchloranthrene	7.73E-08	--	*7.73E-08*	--	--	--	**7.73E-08**
Naphthalene	2.62E-05	--	*2.62E-05*	--	--	--	**2.62E-05**
Pentane	1.12E-01	--	*1.12E-01*	--	--	--	**1.12E-01**
Toluene	1.47E-04	--	*1.47E-04*	--	--	--	**1.47E-04**
Inorganic TAPs							
Arsenic	8.59E-06	5.46E-09	*8.59E-06*	--	--	--	**8.59E-06**
Barium	1.89E-04	--	*1.89E-04*	--	--	--	**1.89E-04**
Beryllium	5.15E-07	3.12E-10	*5.16E-07*	--	--	--	**5.16E-07**
Cadmium	4.72E-05	3.17E-10	*4.72E-05*	--	--	--	**4.72E-05**
Chromium	6.01E-05	4.23E-09	*6.01E-05*	--	--	--	**6.01E-05**
Chromium-VI	--	1.23E-09	*1.23E-09*	--	--	--	**1.23E-09**
Cobalt	3.61E-06	--	*3.61E-06*	--	--	--	**3.61E-06**
Copper	3.65E-05	--	*3.65E-05*	--	--	--	**3.65E-05**
Lead	--	2.65E-09	*2.65E-09*	--	--	--	**2.65E-09**
Manganese	1.63E-05	2.74E-07	*1.66E-05*	--	--	--	**1.66E-05**
Mercury	1.12E-05	--	*1.12E-05*	--	--	--	**1.12E-05**
Molybdenum	4.72E-05	--	*4.72E-05*	--	--	--	**4.72E-05**
Nickel	9.02E-05	3.10E-08	*9.02E-05*	--	--	--	**9.02E-05**
Phosphorus	--	2.72E-08	*2.72E-08*	--	--	--	**2.72E-08**
Selenium	1.03E-06	2.31E-10	*1.03E-06*	--	--	--	**1.03E-06**
Zinc	1.25E-03	--	*1.25E-03*	--	--	--	**1.25E-03**
Total TAPs	**1.93E-01**	**3.47E-07**	***1.93E-01***	**0.00E+00**	**0.00E+00**	***0.00E+00***	**1.93E-01**

1 '--' Emissions of compound are either not present or were not reported in the literature reviewed; 'TBD' To be determined.
2 Material handling sources include truck unloading and front-end loader loading.

TABLE 2-4

PROJECTED FACILITY-WIDE HOURLY TAP EMISSIONS (POUNDS PER HOUR)[1]

EMISSIONS	Dryer	Baghouse Emissions	*TOTAL POINT SOURCE EMISSIONS*	Material Handling Sources[2]	Conveyor Belt Emissions	*TOTAL FUGITIVE EMISSIONS*	TOTAL EMISSIONS
Organic TAPs							
Benzene	2.06E-05	--	*2.06E-05*	--	--	--	**2.06E-05**
Benzo(a)pyrene	1.18E-08	--	*1.18E-08*	--	--	--	**1.18E-08**
Formaldehyde	7.35E-04	--	*7.35E-04*	--	--	--	**7.35E-04**
Hexane	1.76E-02	--	*1.76E-02*	--	--	--	**1.76E-02**
3-Methylchloranthrene	1.76E-08	--	*1.76E-08*	--	--	--	**1.76E-08**
Naphthalene	5.98E-06	--	*5.98E-06*	--	--	--	**5.98E-06**
Pentane	2.55E-02	--	*2.55E-02*	--	--	--	**2.55E-02**
Toluene	3.36E-05	--	*3.36E-05*	--	--	--	**3.36E-05**
Inorganic TAPs							
Arsenic	1.96E-06	1.25E-09	*1.96E-06*	--	--	--	**1.96E-06**
Barium	4.31E-05	--	*4.31E-05*	--	--	--	**4.31E-05**
Beryllium	1.18E-07	7.13E-11	*1.18E-07*	--	--	--	**1.18E-07**
Cadmium	1.08E-05	7.23E-11	*1.08E-05*	--	--	--	**1.08E-05**
Chromium	1.37E-05	9.65E-10	*1.37E-05*	--	--	--	**1.37E-05**
Chromium-VI	--	2.82E-10	*2.82E-10*	--	--	--	**2.82E-10**
Cobalt	8.24E-07	--	*8.24E-07*	--	--	--	**8.24E-07**
Copper	8.33E-06	--	*8.33E-06*	--	--	--	**8.33E-06**
Lead	--	6.05E-10	*6.05E-10*	--	--	--	**6.05E-10**
Manganese	3.73E-06	6.25E-08	*3.79E-06*	--	--	--	**3.79E-06**
Mercury	2.55E-06	--	*2.55E-06*	--	--	--	**2.55E-06**
Molybdenum	1.08E-05	--	*1.08E-05*	--	--	--	**1.08E-05**
Nickel	2.06E-05	7.09E-09	*2.06E-05*	--	--	--	**2.06E-05**
Phosphorus	--	6.22E-09	*6.22E-09*	--	--	--	**6.22E-09**
Selenium	2.35E-07	5.26E-11	*2.35E-07*	--	--	--	**2.35E-07**
Zinc	2.84E-04	--	*2.84E-04*	--	--	--	**2.84E-04**
Total TAPs	**4.40E-02**	**7.91E-08**	***4.40E-02***	**0.00E+00**	**0.00E+00**	***0.00E+00***	**4.40E-02**

1 '--' Emissions of compound are either not present or were not reported in the literature reviewed; 'TBD' To be determined.

2 Material handling sources include truck unloading and front-end loader loading.

3.0 CLASS II AREA AIR QUALITY IMPACT ANALYSIS

This section describes the technical approach used for a Class II air quality impact analysis for the Handy facility. The modeling addresses the impacts from all processes involved in facility operations. The dispersion modeling follows the guidance and protocols outlined in the *State of Idaho Air Quality Modeling Guideline* (IDEQ Modeling Guideline; IDEQ 2002) and the U.S. Environmental Protection Agency (EPA) *Guideline on Air Quality Models (Revised)* (EPA 2005). A modeling protocol describing the proposed modeling approach was submitted to IDEQ on April 11, 2008 (Tetra Tech 2008). This protocol was approved with resolution of comments on April 12, 2008 (IDEQ 2008d).

The IDEQ Modeling Guideline indicates that "a modeling analysis is generally required with each permit application for new construction or a modification that results in an increase in emissions of pollutants for sources permitted by DEQ. The types of permits that require a facility to demonstrate compliance with the NAAQS are permits to construct and Tier II operating permits. A modeling analysis may also be required to demonstrate compliance with the TAP standards." The Handy facility is located in Ada County, which is designated as attainment/unclassifiable for NAAQS pollutants.

For new permit applications, IDEQ established modeling thresholds for criteria pollutant emissions. If the facility-wide emissions for a given pollutant are less than modeling thresholds, dispersion modeling for that pollutant is not required. Criteria pollutants that were assessed include particulate matter with aerodynamic diameter less than or equal to 10 microns (PM_{10}), nitrogen oxides (NO_x) as nitrogen dioxide (NO_2), carbon monoxide (CO), sulfur dioxide (SO_2), and lead (Pb). IDEQ does not require dispersion modeling for volatile organic compounds (VOC) to ozone conversion as part of the permitting process. For TAPs, the facility-wide emissions are compared to screening emission levels (ELs). Modeling is required for those TAPs with emissions that are equal to or greater than the ELs. Applicable ELs are provided in IDAPA 58.01.01.585 and 586.

Modeling thresholds for criteria pollutants are shown in Table 3-1, along with a summary of projected Handy facility emissions. Based on comparisons shown in Table 3-1, NO_x and PM_{10} were the only criteria pollutants that needed to be modeled. Handy facility emissions of all other criteria pollutants were estimated to be less than modeling thresholds.

TABLE 3-1

MODELING THRESHOLDS AND TOTAL PROJECTED CRITERIA POLLUTANT EMISSIONS

Pollutant	Long-Term Modeling Threshold	Projected Handy Facility Emissions	Short-Term Modeling Threshold	Projected Handy Facility Emissions
CO	N/A[a]	N/A[a]	14 lbs/hr	2.0 lbs/hr
NO_x	1 ton/yr	**4.6 tons/yr**	N/A[a]	N/A[a]
PM_{10}	1 ton/yr	**26.2 tons/yr**	0.2 lbs/hr	**6.0 lbs/hr**
SO_2	1 ton/yr	0.03 tons/yr	0.2 lbs/hr	0.01 lbs/hr
Pb	0.6 tons/yr	2.15×10^{-5} tons/yr	100 lbs/month	1.79×10^{-6} lbs/month

a N/A = not applicable.

ELs for TAPs emitted at the Handy facility are shown in Table 3-2, along with a summary of projected Handy facility hourly emissions. Emissions of four TAPs exceeded their respective ELs – formaldehyde, arsenic, cadmium, and chromium-VI. These pollutants were modeled as per IDAPA 58.01.01.585 and 586.

IDEQ recommends that a preliminary analysis (PA) first be conducted when dispersion modeling is warranted. Facility-wide emissions are modeled for the PA to evaluate whether a significant impact exists. Model results are compared to the Class II Significant Contribution Levels (SCLs). Table 3-3 shows the SCLs, which are used to assess whether or not a facility has a significant impact at downwind receptors. When modeling results do not exceed SCLs for a pollutant, no further analysis for that pollutant is required. Based on the comparisons shown in Table 3-1, annual NO_X and annual and 24-hour PM_{10} emissions from the Handy facility were modeled to determine if a significant impact exists.

A full impact analysis (FIA) must be performed if any of the model results exceed the SCLs, which typically requires adding facility-wide emissions to a background concentration to estimate a total concentration. Background concentrations were obtained from IDEQ for the cumulative impact analysis (IDEQ 2008c). The total concentration for a pollutant must demonstrate compliance with the National Ambient Air Quality Standards (NAAQS). Table 3-3 shows the NAAQS increments with which the Handy facility must comply. A Prevention of Signification Deterioration (PSD) increment compliance demonstration is not required because the Handy facility will be a minor source of air pollution.

TABLE 3-2

SCREENING EMISSION LEVELS AND TOTAL PROJECTED TAP EMISSIONS (POUNDS PER HOUR)

EMISSIONS	Dryer	Baghouse Emissions	*TOTAL POINT SOURCE EMISSIONS*	Material Handling Sources[2]	Conveyor Belt Emissions	*TOTAL FUGITIVE EMISSIONS*	TOTAL EMISSIONS	EL (lb/hr)
Organic TAPs								
Benzene	2.06E-05	--	*2.06E-05*	--	--	--	**2.06E-05**	8.00E-04
Benzo(a)pyrene	1.18E-08	--	*1.18E-08*	--	--	--	**1.18E-08**	2.00E-06
Formaldehyde	7.35E-04	--	*7.35E-04*	--	--	--	**7.35E-04**	**5.10E-04**
Hexane	1.76E-02	--	*1.76E-02*	--	--	--	**1.76E-02**	12
3-Methylchloranthrene	1.76E-08	--	*1.76E-08*	--	--	--	**1.76E-08**	2.50E-06
Naphthalene	5.98E-06	--	*5.98E-06*	--	--	--	**5.98E-06**	3.33
Pentane	2.55E-02	--	*2.55E-02*	--	--	--	**2.55E-02**	118
Toluene	3.36E-05	--	*3.36E-05*	--	--	--	**3.36E-05**	25
Inorganic TAPs								
Arsenic	1.96E-06	1.25E-09	*1.96E-06*	--	--	--	**1.96E-06**	**1.50E-06**
Barium	4.31E-05	--	*4.31E-05*	--	--	--	**4.31E-05**	0.033
Beryllium	1.18E-07	7.13E-11	*1.18E-07*	--	--	--	**1.18E-07**	2.80E-05
Cadmium	1.08E-05	7.23E-11	*1.08E-05*	--	--	--	**1.08E-05**	**3.70E-06**
Chromium	1.37E-05	9.65E-10	*1.37E-05*	--	--	--	**1.37E-05**	3.30E-02
Chromium-VI	--	2.82E-10	*2.82E-10*	--	--	--	**2.82E-10**	5.60E-07
Cobalt	8.24E-07	--	*8.24E-07*	--	--	--	**8.24E-07**	0.0033
Copper	8.33E-06	--	*8.33E-06*	--	--	--	**8.33E-06**	0.067
Lead	--	6.05E-10	*6.05E-10*	--	--	--	**6.05E-10**	0.01
Manganese	3.73E-06	6.25E-08	*3.79E-06*	--	--	--	**3.79E-06**	0.333
Mercury	2.55E-06	--	*2.55E-06*	--	--	--	**2.55E-06**	0.007
Molybdenum	1.08E-05	--	*1.08E-05*	--	--	--	**1.08E-05**	0.667
Nickel	2.06E-05	7.09E-09	*2.06E-05*	--	--	--	**2.06E-05**	2.70E-05
Phosphorus	--	6.22E-09	*6.22E-09*	--	--	--	**6.22E-09**	0.007
Selenium	2.35E-07	5.26E-11	*2.35E-07*	--	--	--	**2.35E-07**	0.013
Zinc	2.84E-04	--	*2.84E-04*	--	--	--	**2.84E-04**	0.667
Total TAPs	**4.40E-02**	**7.91E-08**	***4.40E-02***	**0.00E+00**	**0.00E+00**	***0.00E+00***	**4.40E-02**	--

TABLE 3-3

CLASS II SIGNIFICANT CONTRIBUTION LEVELS AND AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Period	Significant Contribution Level ($\mu g/m^3$)[a]	National AAQS ($\mu g/m^3$)[a]
NO_2	Annual	1	100
SO_2	Annual	1	80
	24-hour	5	365[b]
	3-hour	25	1,300[b]
CO	8-hour	500	10,000[b]
	1-hour	2,000	40,000[b]
PM_{10}	Annual	1	50
	24-hour	5	150[b]
Pb	Quarterly	N/A	1.5
Ozone	1-hour	N/A	235

a $\mu g/m^3$ = micrograms per cubic meter; N/A = not applicable
b Not to be exceeded more than once per calendar year

Dispersion modeling was also performed for all TAPs that exceeded the ELs to demonstrate compliance with the Acceptable Ambient Concentrations (AACs), listed in IDAPA 58.01.01.585 and .586. Based on the initial emission inventory, formaldehyde, arsenic, and cadmium exceeded their respective ELs and needed to be modeled.

The following sections discuss the dispersion model that was used in this analysis, potential wake effects of the structures at the Handy facility, terrain, meteorological data, receptors, and model parameters and results.

3.1 DISPERSION MODEL SELECTION

The dispersion modeling was conducted using the American Meteorological Society/Environmental Protection Agency Regulatory Model Improvement Committee Dispersion Model (AERMOD version 07026). This model is recommended by EPA for evaluating Class II impacts within 50 kilometers (km) of the facility being assessed (EPA 2004). Additionally, AERMOD was developed to handle complex terrain. In this analysis, AERMOD was used to predict maximum pollutant concentrations in ambient air from Handy facility emissions. AERMOD was run using all the regulatory default options including use of stack-tip downwash, buoyancy-induced dispersion, calms processing routines, upper-bound downwash concentrations for super-squat buildings, default wind speed profile exponents, vertical potential temperature gradients, and no use of gradual plume rise. Only pollutant dispersion was modeled for this analysis; particle deposition was not considered.

Models for NO_x, arsenic, cadmium, and formaldehyde were run assuming the facility operates 24 hours a day, 365 days per year. These model results are conservative, since the facility only operates a maximum of 12 hours a day. Emissions of 24-hour and annual PM_{10} were modeled to take into account the reduced operating hours. Emission factor files were created, which specified that the Handy facility operates only 9 hours a day in the winter months (November – March) and 12 hours a day in the summer months (April – October). Annual PM_{10} modeling was conducted assuming the facility operates 365 days per year.

3.2 BUILDING WAKE EFFECTS

The potential for downwash effects on stack emissions from nearby structures can be assessed in the AERMOD model. AERMOD model inputs include building dimensions to assess the potential for downwash effects. Building dimensions for the three main structures (Existing Building #1, Existing Building #2, and New Building Addition) were used to build the BPIP-prime (BPIPPRM) input file. The direction-specific downwash parameters were calculated using facility plot-plan maps and BPIPPRM software (version 04274), which is the building downwash program associated with the AERMOD model. Output from BPIPPRM was incorporated into the AERMOD modeling input files.

3.3 TERRAIN DESCRIPTION

The Handy facility is located in Meridian, Idaho, at an elevation of approximately 2,615 feet above mean sea level. The facility is situated in an industrial area with residential areas approximately one-quarter mile north and west of the facility. Industrial land is located to the east and south of the facility. Rural dispersion will be modeled for this effort.

The Handy facility is over 60 miles from the border of the closest Class I area (Sawtooth Wilderness Area). It is not anticipated that emissions from the Handy facility will impact any Class I areas.

3.4 METEOROLOGICAL DATA

Dispersion modeling was conducted using surface meteorological data from the National Weather Service (NWS) station located at the Boise Air Terminal in Boise, Idaho. This station is approximately 8 miles from the Handy facility. Data for the period January 1, 1988, through December 31, 1992 were used. Upper air meteorological data from the Boise, Idaho NWS station for the same period were also used.

These data were selected because they are the most representative available for site conditions at the Handy facility and were recommended by Kevin Schilling of IDEQ via electronic mail (IDEQ 2008b). AERMOD-ready processed meteorological data were provided by IDEQ (IDEQ 2008b). Figure 3-1 shows a windrose diagram of the five years of meteorological data to be used in the modeling analysis.

3.5 RECEPTORS

The Handy facility modeling was completed using a model receptor grid that ensures that maximum estimated impacts from the facility were identified. Following IDEQ and EPA guidelines, receptor locations were identified with sufficient density and spatial coverage to isolate the area with the highest impacts. The following receptor location groups were used for the analysis to accomplish this coverage:

- Fence line at 10-meter intervals;
- 100-meter receptor spacing out to 1 km in all directions from the center of the Handy facility;
- 500-meter receptor spacing between 1 km and 5 km from the Handy facility; and
- 1000-meter receptor spacing between 5 km and 10 km from the Handy facility.